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OF UNUSUAL SIZE.

NEPHRECTOMY — RECOVERY.

By J. H. Kellogg, M. D.

Superintendent Sanitarium, Battle Creek, Michigan; Member American Medical Association, International Periodical Congress of Gynecology and Obstetrics, British Gynecological Society, etc.

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A RENAL CALCULUS OF UNUSUAL SIZE —NEPHRECTOMY—RECOVERY.

BY J. H. KELLOGG, M. D.,
Superintendent Sanitarium, Battle Creek, Mich.

A PATIENT, Mrs. W., aged — years, was brought to me for examination, September 9, by Dr. Darby, of Waterloo, Ind. She had suffered for a long time from pain in the right side, and some time previously the doctor had discovered a hard mass, which upon investigation proved to be an enlarged and prolapsed kidney. The mass was so large that it filled almost the entire right side, reaching from the lower ribs to considerably below the crest of the illium, and extended inward nearly to the median line. The patient suffered so much pain, and was evidently losing ground so rapidly, through the immense quantities of pus discharged with the urine daily, that I thought it best to advise the removal of the diseased organ, and after proper preparation of the patient, proceeded to operate.

My first intention was to operate by the abdominal method, on account of the great size of the mass, but at the last moment I concluded to undertake the operation by the lumbar method, fearing that some condition might be encountered which would render nephrectomy impossible or imprudent, so that the operation might be terminated as a nephrotomy, recalling a remark made by Mr. Lawson Tait, in conversation with the writer when a student assistant with him, in which the operation of nephrectomy was totally con-

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demned, nephrotomy being considered by Mr. Tait the only justifiable operation upon the kidney. Mr. Tait's argument was, that any condition of the kidney likely to be benefited by an operation requires nothing more than nephrotomy, the cases in which nephrectomy would be of any service being in his opinion hopeless, even with a radical operation.

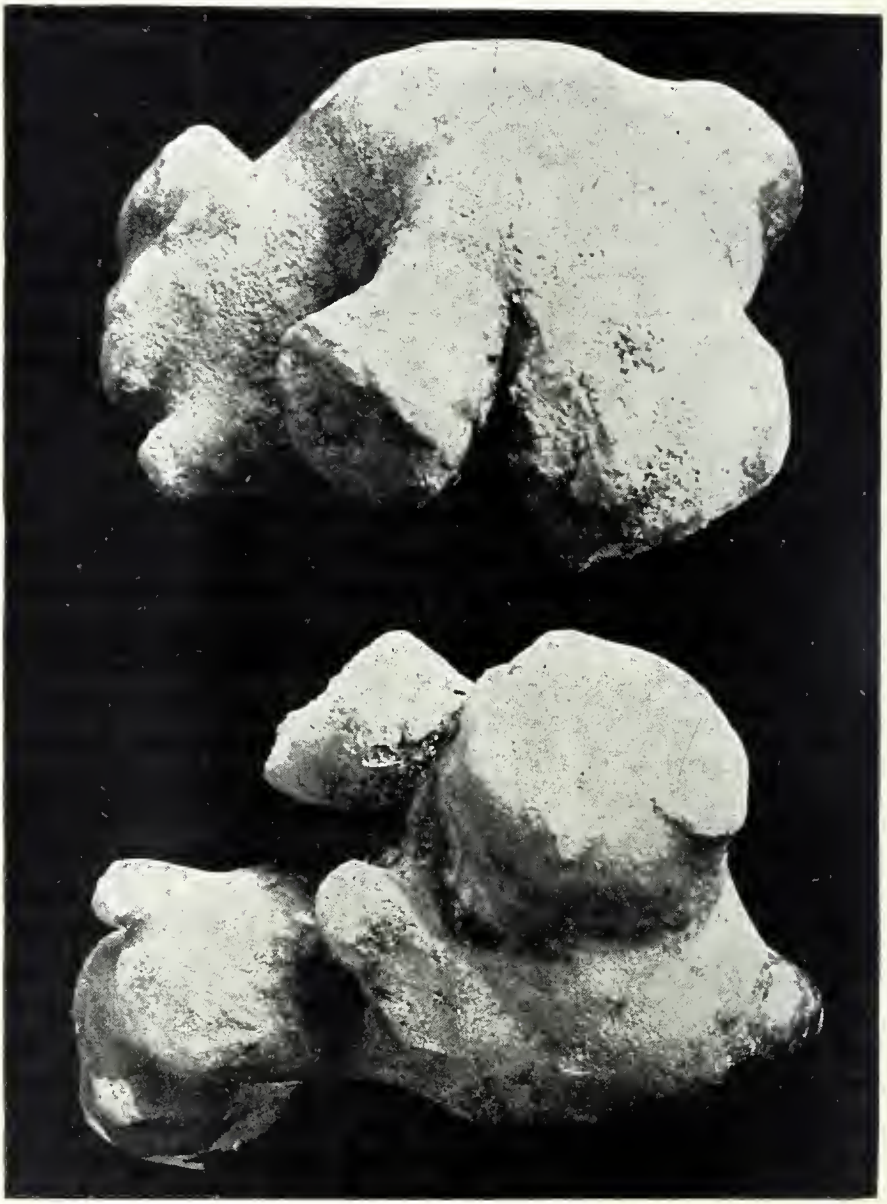
The operation was begun by a vertical incision reaching from the last rib to the crest of the ilium. When the kidney was reached, it was found to be closely adherent to its capsule, as the result of repeated inflammatory attacks which had also consolidated the fat lying outside of the capsule, making it even more difficult to separate the capsule from the adjacent tissues than to break up the adhesions between the kidney and the capsule. It was evident that a large opening would be required for the removal of the mass, and a transverse incision four inches in length, starting from the middle of the first incision, and running toward the linea alba, was accordingly made. This extension of the incision enabled me to introduce the whole hand, and by patient effort, the adhesion between the kidney and its capsule was finally completely broken up. It was, however, found impossible to extricate the enormous mass, although the opening was made as large as possible without entering the peritoneal cavity, by further extension of the transverse incision. I accordingly laid bare and amputated the anterior two thirds of the last rib, and by a considerable effort was then able to pull and push the kidney out of its bed. The central portion of the mass presented a stony hardness, which, taken together with a nodular appearance and feeling of the organ, suggested the probability of a malignant disease. The organ also presented several cyst-like masses, one of which was the size of a large orange.

After ligating the pedicle, excluding the ureter and inclosing the vessels in a separate ligature, I proceeded to amputate the mass, when I at once discovered, from the gritty sensation imparted to my knife, that the central hardness was due to an immense renal calculus which filled the whole inte-

rior of the organ. As soon as the pelvis and the kidney were laid open, a great quantity of mingled pus, mucus, and urine which had been dammed back by the calculus, producing the cystic condition before referred to, rushed out. Precaution had been taken to protect the wound, as far as possible, from infection from this source, and the tissues exposed were thoroughly disinfected; the operation was quickly terminated, two drainage tubes being introduced into the deeper parts of the wound, which was closed by deep sutures, which, when tied, obliterated almost entirely the cavity left by the removal of the kidney. The upper portion of the ureter, which was enormously dilated and thickened, was stitched to the skin. The ligatures were left long so as to facilitate removal, absolute aseptic management of the wound being evidently impossible. Considerable hemorrhage occurred during the operation, as the tissues lying about the kidney were exceedingly vascular. This was well controlled, however, by stuffing the wound from time to time with sterilized gauze and by application of sponges wet in hot water.

The calculus was found to weigh 137 grams, the largest of the kind removed during life of which I have found any record. A photo-reproduction of the calculus, natural size, is here presented.

The patient made a rapid and excellent recovery. The temperature subsequent to the operation, did not at any time exceed 101.4°. Only the very slightest suppuration occurred, so that the tubes were removed in a few days. On the tenth day all the sutures were removed. Within a few days subsequent to the operation, the condition of the patient was found to be decidedly better than before the operation. The pus, which before the operation had been so great in quantity as to render the urine very thick and its filtration very slow, had disappeared almost entirely. Before the operation, the quantity of urine passed in twenty-four hours was 850 c. c.; the specific gravity, 1018; urea, 18.7 grams; total solids, 30.6 grams. The pus was so great as apparently to constitute fully



one half of the total amount of liquid; and boiling, after the addition of nitric acid, showed a quantity of albumen 1–32nd of the volume of the urine tested.

The toxicity of the urine, as determined by the method of Bouchard, which consists of an injection of the urine into the veins of a rabbit in quantities sufficient to produce death, was as follows: The amount required to kill a rabbit weighing 1.4 kilos, 40 c. c., making a urotoxie, or the amount required to kill one kilogram of rabbit, 28.6 c. c.; the total number of urotoxies produced in twenty-four hours, or the possible amount of living being killed by the urine of twenty-four hours, 29.7 kilos; the urotoxic coefficient, or possible amount of living being killed by the urine produced by each kilogram of patient in twenty-four hours, .6. The rabbit died in two minutes from the beginning of the injection, with slight spasm, the pupil being first contracted, then dilated; the temperature rose .4 of one degree C. In three days after the operation, the amount of urine was found to be 900 c. c. The reaction, formerly extremely alkaline, had become normally acid, 10 c. c. of the urine requiring 1.5 c. c. of the decinormal solution of sodium hydrate to neutralize it. The specific gravity was 1030; the urea, 48.6 grams; there was a bare trace of albumen, and only a few pus corpuscles to be found in each field. One half minute after the beginning of the injection, the rabbit's pupils began to contract, and a powerful tetanic spasm occurred, which continued until death, one minute after the injection began. The pupils were extremely contracted, and there was pronounced exophthalmus, but no change in temperature.

The toxicity was found to be as follows: Amount required to kill a rabbit, the weight of which was 1.8 kilos, 16 c.c.; urotoxie, 8.6; number of daily urotoxies, 104.6; the urotoxic coefficient, 2.113. The amount of urea produced by the one kidney subsequent to the operation was more than two and one half times that produced before the operation. The amount of total solids was more than double, and the toxicity was two and one half times as great, being nearly five times greater than

normal, indicating an abnormal increase of toxic matters in the system subsequent to the operation, perhaps in part the result of absorption from the extensive wound, although sepsis in the wound was almost entirely absent.

October 2, three weeks after the operation, an examination of the urine gave the following results: Quantity for 24 hours, 1421 c.c.; specific gravity, 1016; urea, 21.3; total solids, 55.47 grams.

A very slight sediment, consisting of urates, phosphates, and oxulates; no pus; no albumen; reaction natural.

These observations are of interest, as showing the ability of a kidney to assume double duty at once, when called upon to do so, and even to do an amount of work considerably greater than that ordinarily performed by two sound kidneys. The patient's suffering the night following the operation, was so slight that considerable sleep was obtained. She has already recovered from the operation, and, with the exception of being somewhat weak from confinement in bed, is in every way in a better physical condition than before the operation was performed.